



USAID
FROM THE AMERICAN PEOPLE

LIVESTOCK PESTS AND DISEASES IN THE SAHEL

THE POTENTIAL IMPACT OF CLIMATE CHANGE

CONTEXT

Most climate models project that temperatures will increase throughout the Sahel as a result of climate change. Conversely, there is significant uncertainty around the effects of climate change on precipitation, though, on average, the models suggest there will be a slight increase in annual rainfall in the central Sahel and a decrease in the west. Climate change may also affect the onset of the rainy season, and cause an increase in extreme events. These changes may affect the risks associated with diseases and pests that afflict livestock.

FINDINGS

The report, “Agricultural Adaptation to Climate Change in the Sahel: Expected Impacts on Pests and Diseases Afflicting Livestock,” catalogs the current prevalence and impact of pests and diseases on six important livestock species. Peer-reviewed scholarly journals identify and describe about 50 diseases and pests that currently affect these six species. The full report includes profiles of each pest and disease, and provides information on the mode of transmission and overall impact of each. It also contains information on the environmental conditions that affect the spread of the disease or pest, including the relationships between climate, livestock management, land use, and pathogen transmission. The full report also offers possible mitigation strategies. Finally, the study identifies how projected future conditions may affect each pest or disease.

Given the high uncertainty around future rainfall, this study uses two simplified scenarios for climate conditions for 2025 — hot and wet, and hot and dry — to make rough projections about the possible effects of climate change on the risk factors for those pests and diseases.

Changes unrelated to climate will also affect the risks of pests and diseases in the Sahel. In addition, farmers and pastoralists will adapt new techniques for managing diseases and will likely adopt livestock breeds with different levels of resistance to certain pests and diseases. Farmers may also move their livestock into new and different types of land, which may also affect risks.

A sample entry, on the vector-borne disease known as bluetongue that affects sheep and goats, is included on the following page.

SHEEP AND GOATS

Compared to cattle, Small Ruminant flocks have shorter gestation intervals / higher birth rates and recover faster after drought. This has already led to over-proportional growth of goat/sheep populations. The result is an ever increasing relative importance of sheep and goat diseases.

Vector-borne Diseases

BLUETONGUE

- Arthropod-borne viral pathogen (“Arbovirus”) affecting particularly sheep; it causes severe inflammation of the nasal and oral cavity and of the coronary band above the hooves; there is strong muscle pain and swelling of the head and neck; extreme variability in clinical manifestation (almost invisible in endemic areas); mortality in sheep 2 to 30 percent; very mild in goats.
- Transmitted by midges (*Culicoides spp.*), which can be wind-carried over long distances; bluetongue episodes outside endemic humid to sub-humid areas occur in relation to seasonal high rainfall and strong winds; naïve sheep flocks moving from non-endemic arid into endemic sub-humid areas are at particularly high risk of severe disease.
- Severe clinical form: prolonged recovery period; renders sheep flock temporarily unproductive.

Climate change influence on vector, pathogen-transmission, livestock management, land use

- Higher rainfall leads to enhanced reproduction and biting activity of midges with an increase in virus transmission
- Wind speed affects long distance spread of infected midges
- Under arid conditions migration of naïve herds into endemically infected areas is more likely

Current Disease Status in the Sahel	Climate Change Scenario	Expected Climate Change Impacts by 2025		Possible mitigation strategy
		Disease unlikely to gain in importance	Disease likely to gain in importance	
Virus very likely endemic in sub-humid parts of the Sahel, only reported by Algeria (camels suspected as silent carriers)	Hot/Wet		Endemic over expanded range → overall higher losses	Improved vaccination cover
	Hot/Dry	Smaller endemic area → overall lower losses		

ADDITIONAL INFORMATION

This brief highlights key conclusions from Younan, M. (2013). *Agricultural Adaptation to Climate Change in the Sahel: Expected Impacts on Pests and Diseases Afflicting Livestock*. USAID. Interested readers are invited to review the full paper at <http://community.eldis.org/ARCC/>.